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LAKE STURGEON CREEL SURVEY OF THE MENOMINEE RIVER WISCONSIN-MICHIGAN BOUNDARY WATER, 1981-1984

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ABSTRACT

From 1981 through 1983 a creel survey on lake sturgeon was conducted along portions of the Menominee River to determine whether a 1974 size limit increase had reduced sturgeon harvest. Each year the survey took place during the hook and line sturgeon fishing season in September and October.

Lake sturgeon fishing pressure was found to be about half what it was 10 years before this study, and harvest has been reduced. Approximately 20 lake sturgeon are harvested each year, though harvest numbers fluctuate annually. Harvest estimates derived from the creel survey appear to be inflated. Mandatory registration of lake sturgeon began in 1983 and should be a reliable means of monitoring harvest.

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INTRODUCTION

Lake sturgeon, Acipenser fulvenscens Rafinesque, are slow-growing, late-maturing fish that cannot survive a high level of exploitation (Priegel and Wirth 1974). Hook and line lake sturgeon fishing is provided on only 5 watershed systems in Wisconsin, including the Menominee River which has the largest minimum size limit and is probably the most restricted in area (Fig. 1, Table 1).

Historical accounts from the mid-1800s refer to the Indians of the region as depending on sturgeon for their subsistence at certain times of the year. Lake sturgeon could migrate from the waters of Green Bay up the Menominee River as far as Sturgeon Falls, which acted as a natural barrier preventing further upstream travel. It is reported that at this site Indians would pile sturgeon like cordwood for winter consumption (Larson 1963).

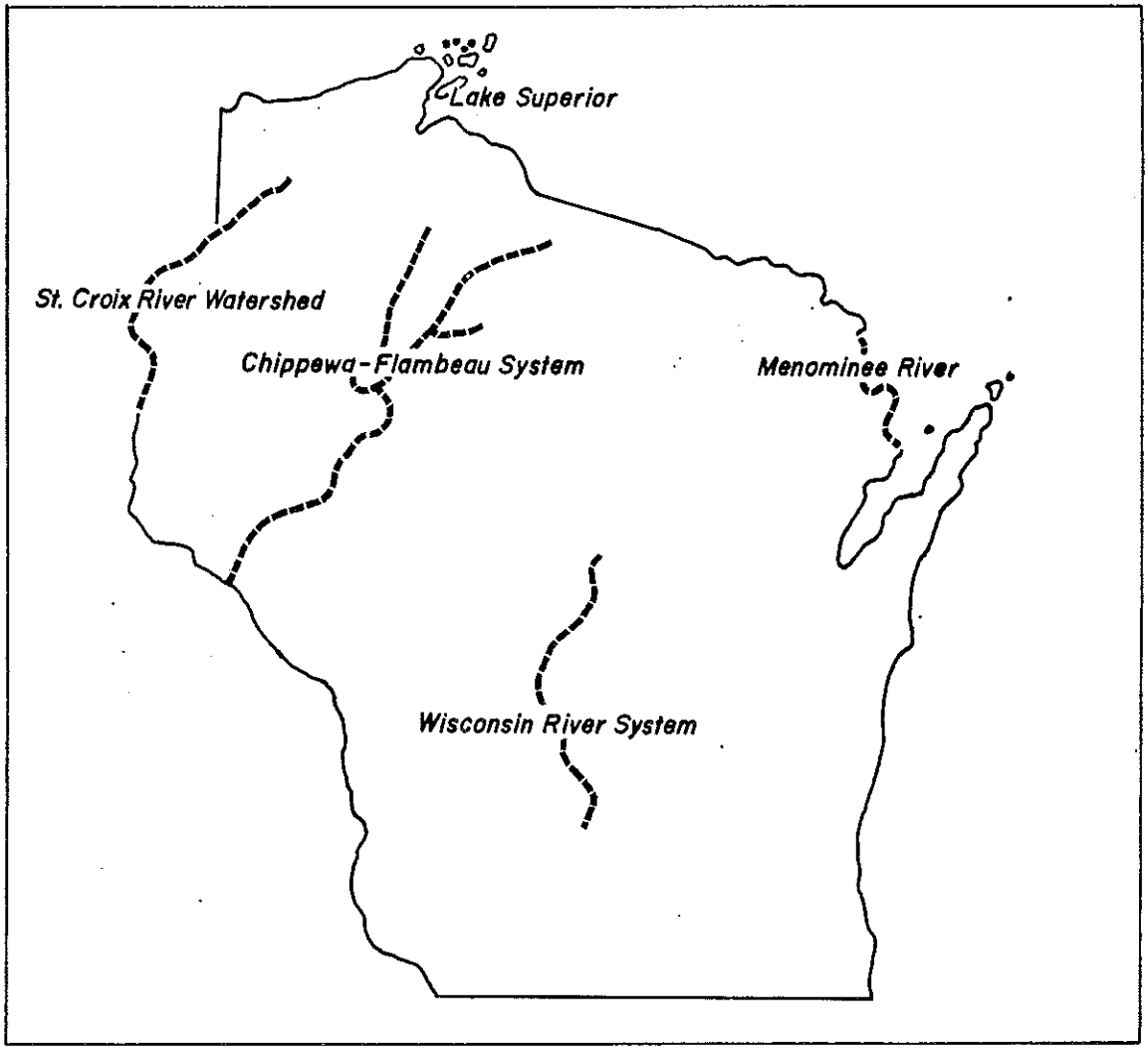

FIGURE 1. Major watershed areas in Wisconsin providing hook and line lake sturgeon fishing.

TABLE 1. Lake sturgeon hook and line regulations in Wisconsin.

Water	Season	Bag Limit	Min. Length
Menominee River (Wis-Michigan boundary waters)	1st Sat. in Sep thru 1 Nov	2 per season	50"
Wis-Minnesota boundary waters	1st Sat. in May thru 31 Oct	1 per season	45"
Wis-Iowa boundary waters	None		
Lake Superior and bays	Continuous	1 per season	40"
Wisconsin inland waters*	1st Sat. in Sep thru 15 Oct	1 per season	45"

* Except Lakes Poygan, Winneconne, Butte des Morts, Winnebago, and connecting waters; in the Embarrass River from the Pella Dam in Shawano County downstream; the Wolf River from the dam at Shawano downstream to Lake Poygan; and the Fox River downstream from milespost No. 63, (Johnson Creek) in Green Lake County to Lake Butte des Morts - where there is no open season.

Today there are 5 dams below Sturgeon Falls, and lake sturgeon migration from Green Bay up into the Menominee River is not possible. The dams farthest downsteam, Upper and Lower Scott dams, were constructed as wooden crib dams in 1862 and 1879 and then replaced by the present structures in 1920 and 1924, respectively.

Lake sturgeon inhabit sections of the Menominee River between the White Rapids and Grand Rapids dams, between Grand Rapids dam and the Upper Scott dam in Marinette-Menominee, and below the Lower Scott dam (Fig. 2). No lake sturgeon were captured in sections of the Menominee River between the White Rapids and Sturgeon Falls dams during electrofishing surveys conducted in 1971, 1972, and 1980.

A creel survey was conducted in the area between the White Rapids and Grand Rapids dams in 1969-70 as part of a study designed to determine sturgeon harvest rates and estimate the lake sturgeon population (Priegel 1973). The study concluded that the sturgeon exploitation rate was too high (Priegel 1973). Consequently, in 1974 the size limit was increased from 42 inches to 50 inches in an effort to reduce angler harvest (Table 2).

This study assesses the impact of the 1974 size limit increase on sturgeon harvest in the Menominee River. It was designed to closely follow the methods used in the 1969-70 study. In 1981-82 a creel survey was again conducted on the section of river between the White Rapids and Grand Rapids dams. In 1983 a creel survey was conducted from below the Grand Rapids dam down to County X Park (Fig. 2).

Mandatory registration was begun in 1983 during the hook and line lake sturgeon season in Wisconsin. This supplied valuable data needed in making management decisions and enabled researchers to test the reliability of the creel survey.

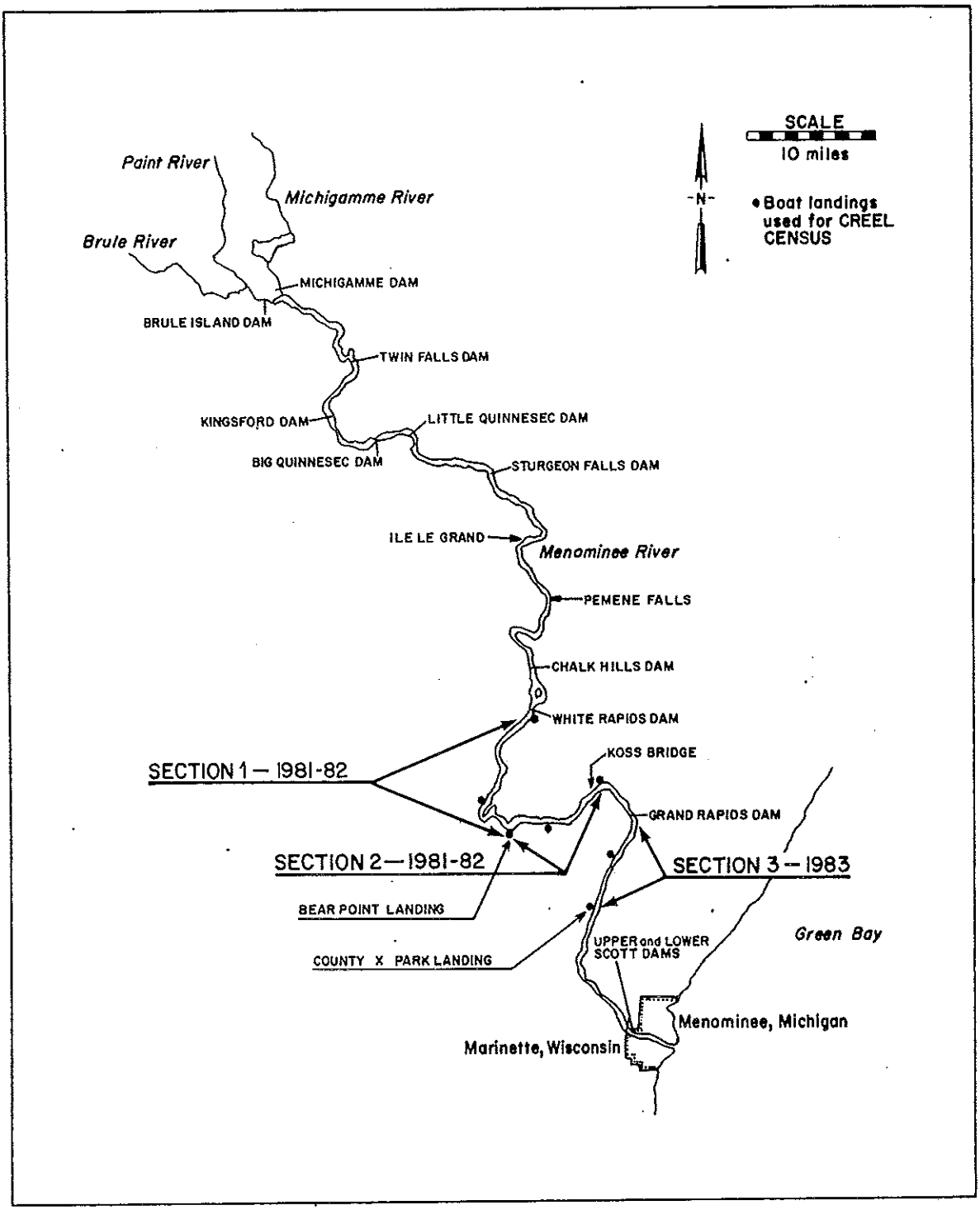

FIGURE 2. Menominee River, showing dam locations and the intensive study area.

TABLE 2. Lake sturgeon hook and line regulation changes on the Menominee River, 1959-present.

Years	Season	Bag Limit	Min. Length
1959	15 Sep thru 15 Oct	3 per season	30"
1960-62	15 Sep thru 15 Oct	2 per season	30"
1963-65	1st Sat. in Sep thru 15 Oct	2 per season	42"
1966	1st Sat. in Sep thru 1 Nov	2 per season	42"
1967	1st Sat. in Sep thru 1 Nov	2 per season	40"
1968-73	1st Sat. in Sep thru 1 Nov	2 per season	42"
1974-present*	1st Sat. in Sep thru 1 Nov	2 per season	50"

* In 1983 Wisconsin initiated mandatory registration of lake sturgeon caught by hook and line. Tags are available free of charge and must be picked up before fishing lake sturgeon. Persons who take a lake sturgeon must immediately attach the lake sturgeon hook and line tag and register it at a DNR registration station no later than 6:00 p.m. the day after the fish was caught.

STUDY AREA

The Menominee River is 93 miles long, with an average width of 475 ft and a 4,055-mile^2 drainage area. It originates at the junction of the Brule and Michigamme rivers in northeastern Florence County, Wisconsin, and flows into Green Bay at Marinette-Menominee. The entire length of the river serves as a border between Wisconsin and Michigan.

Rubble, gravel, and sand are the major bottom types in the sections studied. Seven hydroelectric dams and 3 paper mill dams currently operate on the river; however, the watershed is largely undeveloped and primarily forested. Waterfowl use the river, and a few bald eagles can be found nesting along its shores.

METHODS

Creel Survey

In 1981-82 the segment of the Menominee River chosen for creel survey was divided into 2 sections. Section 1 (approximately 17 river miles) was from the White Rapids dam downstream to the Bear Point landing. Section 2 (approximately 9 river miles) was from the Bear Point landing to the Koss Bridge landing, which lies 3 miles upstream from the Grand Rapids dam. One creel clerk was assigned to each section of the river.

In 1983 the creel survey covered the area from the Grand Rapids dam downstream to County X Park. One clerk was responsible for this 7-mile section of river.

The creel survey was designed to assess sturgeon fishing pressure and harvest. Each year surveys were taken during the lake sturgeon season, which runs from the first Saturday in September through 1 November. Survey schedules covered a 12-hour fishing day approximately corresponding to daylight hours. The 1983 survey schedule fit daylight hours better than the 1981-82 schedule, which was designed to duplicate the 1969-70 study.

Creel clerks were randomly scheduled each day to work a specified launching point, launching time, and count time. The launching point was either the upper end, mid-point, or lower end of each section. In 1983 only lower- and upper-end launching points were used due to the smaller size of the river section. The launching time for morning and afternoon shifts indicated when the clerk should arrive at the river, launch the boat, and be ready to go. The count time indicated when during the shift the clerk was to begin the downstream count of active anglers. Clerks were to spend 6 hours working on the river each scheduled day (Append. 1).

Counts always started at the upper end of the assigned section. Motoring downstream as rapidly as was safe, clerks recorded the number of anglers they passed who were actively fishing. In 1981-82 these counts took 1 hour and 45 minutes on Section 1 and 45 minutes on Section 2. In 1983 the counts took about 40 minutes. No anglers were interviewed during the counts, which were designed to determine angling pressure.

However, before and/or after the downstream counting trip, the clerk interviewed anglers for harvest information. For example, a clerk would launch a boat by 6 a.m. at the mid-point landing and start motoring, looking for anglers, and interviewing them. If necessary, interviews were discontinued to ensure the clerk's arrival at the upper end of the section by 9 a.m. At 9 a.m. the clerk would motor downstream, recording the number of active anglers. Upon reaching the lower end of the section the clerk would again look for anglers and interview them until the tour of duty was completed. These angler interviews were recorded on Angler Interview Form 3600-114 (Append. 2).

To obtain information from anglers once they completed their fishing day, clerks gave interview forms (DNR-addressed postcards) to all anglers they had personally interviewed (Append. 3). Clerks asked anglers to complete the information form at the end of their fishing day and return it. This postcard method was the only one used in the 1969-70 study.

Total fishing pressure for the season was calculated separately for weekends and weekdays--50% of the weekends were sampled, while 30% of the weekdays were sampled. Also, fishing pressure for the opening weekend was calculated separately, and Labor Day was treated as a weekend day. Counts made on the 2 sections on the same day were combined into a single count for the entire study area.

Fishing pressure was calculated for each category of days as the number of days x 12 hours per day x appropriate average angler count.

Two harvest rates were calculated:

(1) Using postcard returns, the number of harvested lake sturgeon reported on the postcards was divided by the total fishing hours reported on the postcards. This is the method used by Priegel (1973) in his study.

(2) Using direct interviews, the number of harvested lake sturgeon the clerk recorded while on duty was divided by the number of fishing hours the clerks surveyed, combining both complete and incomplete fishing trips.

Total harvest was then estimated by multiplying 1 of the 2 harvest rates by the total estimated fishing pressure. Since 2 separate harvest rates were calculated each year, 2 different total harvest estimates were obtained. The same total estimated fishing pressure was used for both.

Mandatory Registration

In 1983 Wisconsin mandated registration of lake sturgeon caught by hook and line. Wisconsin anglers are required to obtain tags prior to sturgeon fishing and to fill out a questionnaire on their previous year's sturgeon fishing. Although Michigan did not require registration in 1983, some Michigan anglers did pick up tags and register their sturgeon.

Persons who take a legal fish must immediately attach a metal tag to the fish and register it at a DNR registration station no later than 6 p.m. the day after the fish is caught.

RESULTS

Fishing Pressure

Lake sturgeon fishing pressure on the Menominee River in the area between the White Rapids and Grand Rapids dams was 6,318 angler hours in 1981 and 6,259 in 1982, 49% less than in the 1969-70 study for the same area (Table 3). Fishing pressure on the section of river between the Grand Rapids dam and County X Park was 4,803 angler hours in 1983.

One explanation for this dramatic decrease in fishing pressure is the 1974 increase in the minimum size limit. Also, the development of a fall salmonid fishery on the waters of nearby Green Bay may be attracting anglers away from lake sturgeon.

An average of 72% of the fishing pressure occurred in September and 28% occurred in October. This seasonal distribution is very similar to that found in the 1969-70 study, 75% in September and 25% in October.

Weekend fishing pressure was 56% of the total fishing pressure in 1981, 63% in 1982, and 76% in 1983. Weekend pressure in 1969-70 was 63% and 68%, respectively.

Harvest

Harvest was estimated from voluntary postcard returns, direct interviews, and, in 1983 and 1984, mandatory registration (Table 4).

The size limit was 42 inches in 1969 and 1970, when 59 and 48 lake sturgeon, respectively, were estimated to have been taken from the Menominee River between the White Rapids and Grand Rapids dams (Priegel 1973). These harvest figures were estimated from postcards returned by 69% of the anglers in 1969, and 56% in 1970 (Append. 4).

TABLE 3. Average daily counts of anglers and estimated fishing pressure (angler hours) on the Menominee River, 1969, 1970, 1981, 1982, and 1983.

Periods	Average Daily Counts 1969	1970	Average Daily Counts 1981	1982	1983	Fishing Pressure 1969	1970	Fishing Pressure 1981	1982	1983
First weekend*	87	126	46	46	37	3,100	4,600	1,656	1,644	1,332
Other Sep weekends	50	29	20	19	19	3,600	2,100	1,452	1,339	1,354
Sep weekdays	18	11	8	7	3	3,400	2,200	1,657	1,447	629
Oct weekends	22	8	5**	8	8	2,300	1,000	444**	987	960
Oct weekdays	7	6	4	3**	2**	1,900	1,500	1,109	842**	528**
Total season						14,300	11,400	6,318	6,259	4,803

* Includes Labor Day.
** Includes 1 Nov.

TABLE 4. Lake sturgeon harvest data (numbers) by year, river, section, and methods.

Methods	Number of Sturgeon Harvested Section 1 and 2* 1969	1970**	1981	1982	1983	1984	Section 3 1983	1984
Postcards returned[a]	59	48	18	43	—	—	14	—
Direct interviews	—	—	20	43	—	—	24	—
Mandatory registration	—	—	—	22[b]	9	8	9	4

* Sections 1 and 2 refer to the section of river between the White Rapids and Grand Rapids dams. Section 3 refers to the section of river below the Grand Rapids dam to County X Park.
** In 1969–70 the size limit on lake sturgeon in the Menominee River was 42 inches. In other years the size limit was 50 inches.
a The values obtained for postcards returned and direct interviews are estimates. The postcard returns were on a completely voluntary basis.
b In 1983, 812 anglers picked up Menominee River lake sturgeon registration tags. Upon receiving the free tags they were asked to fill out a questionnaire requesting information on the 1982 fishing season. They reported harvesting 22 lake sturgeon on the entire Menominee River. These fish were not actually registered.

The lower harvest estimates in the present study are probably due to the increase to a 50-inch size limit. Based on returned postcards in 1981 and 1982, an estimated 18 and 43 lake sturgeon, respectively, were taken from the same section of river. In 1981, 50% of the anglers returned postcards; in 1982, 41% returned them.

Also based on returned postcards, an estimated 161 and 146 lake sturgeon longer than 42 inches were caught in 1981 and 1982, respectively (Append. 4).

Harvest estimates made from direct interviews for the same section of river were 20 lake sturgeon in 1981 and 43 in 1982. Catch numbers for sturgeon over 42 inches were not obtained from direct interviews.

The 1983 harvest estimate also reflects the increased size limit. Based on returned postcards, 14 lake sturgeon were harvested from the river section between the Grand Rapids dam and County X Park, of an estimated 79 sturgeon over 42 inches that were caught. In 1983, 31% of the anglers returned postcards. Based on direct interviews, the 1983 harvest was 24 lake sturgeon. Appendix 4 contains a total summary of the lake sturgeon catch and harvest statistics.

In 1983 and 1984, 9 and 8 lake sturgeon, respectively, were registered as taken from the area between the White Rapids and Grand Rapids dams. Also in 1983 and 1984, 9 and 4 lake sturgeon, respectively, were registered as taken from the area between the Grand Rapids dam and County X Park (J. Klingbiel, pers. comm. 1985). The 812 tag recipients who completed the questionnaire in 1983 reported harvesting 22 lake sturgeon from the entire Menominee River in 1982, all sections included.

Lengths of the 67 individual lake sturgeon known harvested ranged from 50.0 to 66.8 inches and averaged 54.2 inches (Fig. 3). During the 4 years covered in this study, only 1 angler reported harvesting 2 sturgeon in the same year, and 2 anglers reported catching and releasing legal-sized fish.

Angler Characteristics

Angler characteristics were determined from direct interviews. An average of 83% of the sturgeon anglers were Wisconsin residents, 8% were Michigan residents, and 9% were Illinois or Indiana residents (Table 5).

The residency of Wisconsin anglers is broken down by county. An average of 38% were from the Marinette area, 48% were from the Fox Valley area, and 10% were from the Milwaukee area (Fig. 4).

The proportion of anglers who reported they were fishing specifically for sturgeon was 98% in 1981, 99% in 1982, and 79% in 1983. These percentages were not figured into the harvest rates.

For the 3 years of the creel survey, an average of 85% of the anglers were male and 90% were 16-64 years old.

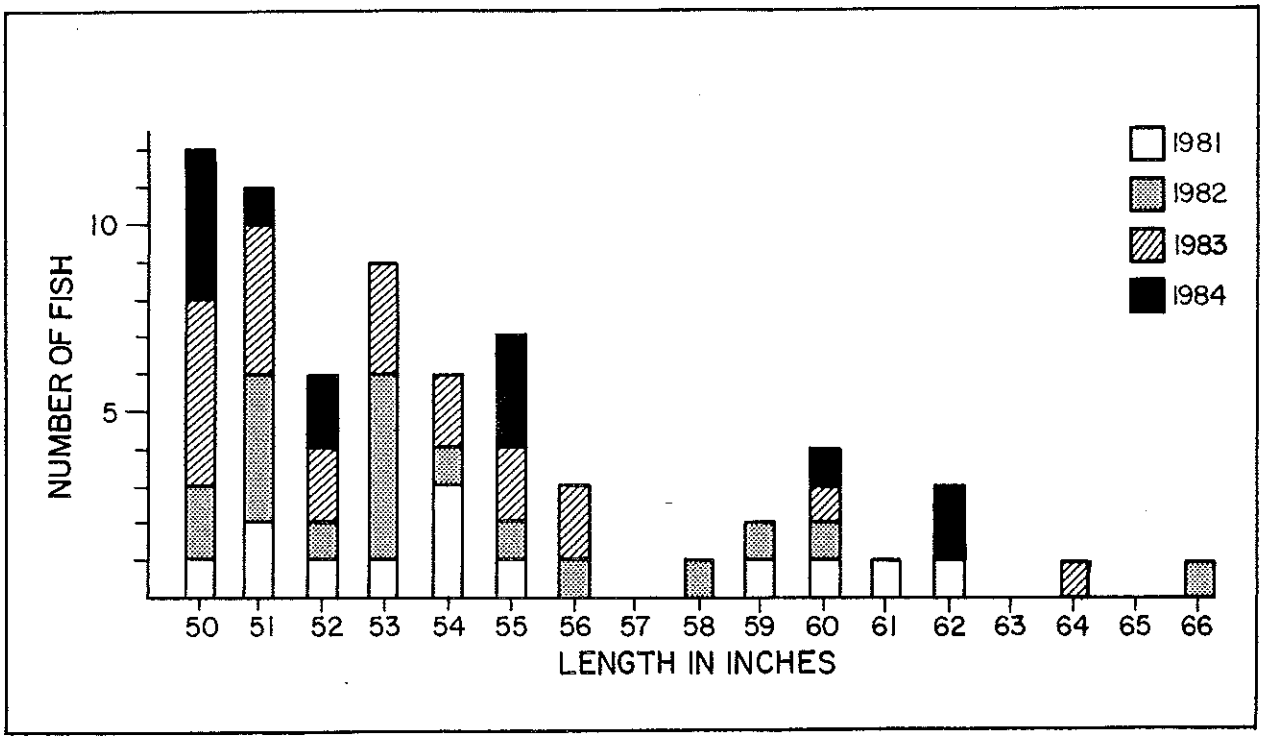

FIGURE 3. Length of individual lake sturgeon known harvested during study years.

TABLE 5. Residence of Menominee River lake sturgeon anglers and return of self-addressed postcards.

State Comparisons

Year	Wisconsin % Anglers	Wisconsin % Card Returns	Michigan % Anglers	Michigan % Card Returns	Other % Anglers	Other % Card Returns	Total # Anglers	Total % Cards Returne
1981	87	88	7	5	6	7	407	50
1982	91	93	4	4	5	3	526	41
1983	72	83	12	8	16	9	560	31
Avg.	83	88	8	6	9	6	498	41
1969	78		14		8		552	69
1970	78		9		13		411	56

Wisconsin County Comparison

Year	Marinette Area % Anglers	Marinette Area % Card Returns	Fox Valley Area % Anglers	Fox Valley Area % Card Returns	Milwaukee Area % Anglers	Milwaukee Area % Card Returns	Misc. % Anglers	Misc. % Card Returns
1981	45	37	38	49	12	9	5	5
1982	47	34	40	52	10	9	3	5
1983	21	5	65	79	8	12	6	4
Avg.	38	25	48	60	10	10	5	5

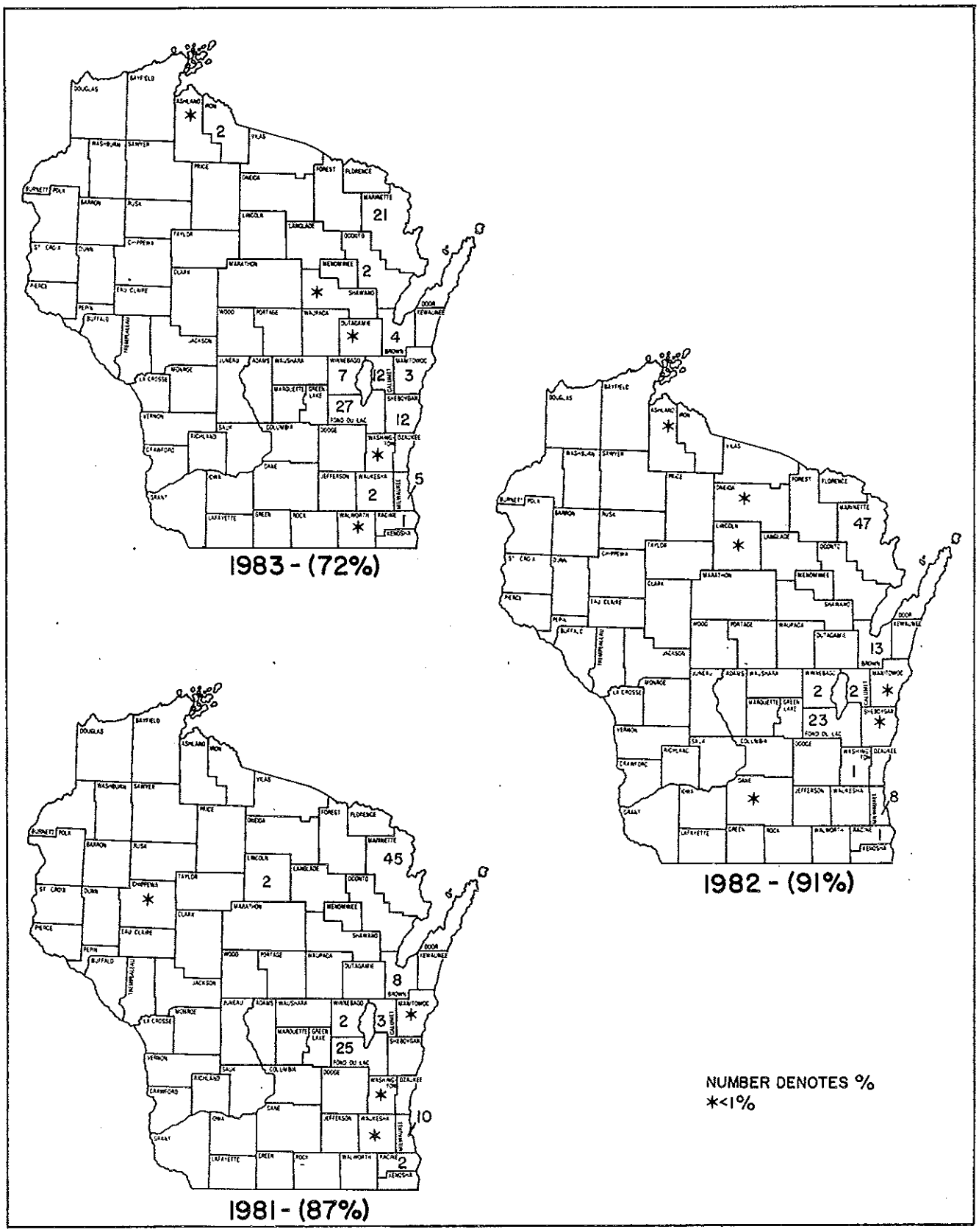

FIGURE 4. Wisconsin county residency of Menominee River lake sturgeon anglers. Values in parentheses are percent of total anglers from Wisconsin.

DISCUSSION

All measures indicate that fishing pressure on lake sturgeon in the Menominee River is substantially less than it was 10 years ago. In 1981-82 the average daily angler counts on the section of river between the White Rapids dam and the Grand Rapids dam were about half what they were 10 years before (Table 3).

In 1983 and 1984, 812 and 811 anglers, respectively, applied for Menominee River sturgeon tags. Of the 811 anglers who received sturgeon tags in 1984, 371 reported not having fished for sturgeon the previous year. Apparently, many people apply for the tags just in case they decide to fish for lake sturgeon.

While creel survey estimates declined since 1969-70, data indicate that these estimates were too high. Conversely, the number of sturgeon from the Menominee that were caught, tagged, and registered is probably lower than the actual number harvested.

An important consideration in estimating lake sturgeon harvest is the small number of fish actually surveyed. Estimates based on expansion of this creel survey data will thus have wide confidence margins. Additional considerations are discussed below.

The voluntary postcard method assumes that someone who does not catch a legal sturgeon is just as likely to report as someone who does. This assumption did not prove true. In 1981 an average of 50% of all anglers directly interviewed returned postcards, but 66% of those anglers interviewed who had caught legal sturgeon returned postcards. In 1982 the average of all postcard returns was only 41%, but 88% of those anglers who had legal sturgeon turned in a postcard. Thus, anglers who had caught legal sturgeon were more likely to return postcards than anglers who had not, and estimates made from this information would be inflated.

However, this pattern was not repeated in 1983. Only 1 of 8 anglers interviewed who had legal sturgeon returned postcards, yet 6 of the 8 registered their sturgeon. Perhaps anglers felt that mandatory registration made returning postcards unnecessary.

Normally, creel surveys through direct interviews assume that the chances of coming across a successful or unsuccessful angler are equal and that the clerk's selection of anglers to interview is totally random. This may not occur with the sturgeon fishery because of the few fish actually found and the creel clerk's tendency to seek out successful anglers.

If compliance with the law is assumed, the mandatory registration values should be accurate. However, Michigan did not require registration of its Menominee River sturgeon harvest in 1983, and complete compliance with the new regulation in Wisconsin is unlikely. For example, in 1983 interviews and postcards accounted for 3 legal fish that were not registered. Two were caught by Michigan residents and 1 by a Wisconsin resident. Thus, mandatory registration of the sturgeon harvest in Wisconsin underestimates the actual harvest.

The sturgeon harvest has significantly decreased since the size limit was increased. Catch estimates indicate an increase in the number of 42- to 50-inch sturgeon that are caught and released as a result of the increased size limit. Most anglers also reported catching and releasing small sturgeon, an experience that enhances anglers' enjoyment.

Above the Grand Rapids dam anglers almost exclusively fished for lake sturgeon. Below the dam, however, 21% of the anglers reported fishing for other species. Smallmouth bass, walleye, northern pike, panfish, suckers, and/or redhorse were also caught. Almost half of the anglers who returned postcards (44%) reported catching suckers and/or redhorse, which they sometimes would cut up and use for sturgeon bait. Night crawlers were the most commonly used bait, however, with crayfish a distant second.

MANAGEMENT CONSIDERATIONS

Presently, management of lake sturgeon in the Menominee River is not designed to increase yield, but rather to protect habitat, limit exploitation, and provide the angler with opportunities to catch trophy fish.

The increase to a 50-inch minimum size limit and the recent reduction in angler pressure have provided trophy fishing opportunities. A general estimate of the hook and line harvest from the Menominee River is about 20 lake sturgeon per year--a seemingly small number, but enough to give successful sturgeon anglers quite a thrill. The study suggests that lake sturgeon harvest varies from year to year, possibly due to fluctuating water levels.

A number of questions have been raised regarding the reliability of the creel survey harvest estimates arrived at in this study. Mandatory registration combined with greater law enforcement efforts to assure compliance should prove an accurate and reliable method of determining harvest. The registration system coordinated between Wisconsin and Michigan since 1986 will provide accurate harvest data and allow management decisions that will ensure a continued hook and line sturgeon fishery.

Careful management of the existing lake sturgeon stock is essential. Although hatchery-reared lake sturgeon have recently been planted in the Menominee River below the Sturgeon Falls dam, survival of those fish has not been documented. Even if successful it would take up to 25 years to establish a fishery.

Preservation of lake sturgeon is also the responsibility of the people of Wisconsin and Michigan. An educational program is recommended to increase public awareness of this unique fish and the importance of limiting its exploitation and maintaining its habitat.

APPENDIX 1. Creel census schedule.

1981 and 1982

September (12-hour fishing day)

River duty times		Count times (one count per day, time randomly selected)
A.M. shift	600 - 1200	700, 900, 1100
P.M. shift	1200 - 1800	1300, 1500, 1700

October (12-hour fishing day)

River duty times		Count time (one count per day, time randomly selected)
A.M. shift	600 - 1200	700, 900, 1100
P.M. shift	1100 - 1700	1200, 1400, 1600

1983

September (12-hour fishing day)

River duty times		Count times (one count per day, time randomly selected)
A.M. shift	600 - 1230	700, 900, 1100
P.M. shift	1200 - 1830	1300, 1500, 1700

October (12-hour fishing day)

River duty times		Count times (one count per day, time randomly selected)
A.M. shift	700 - 1300	730, 930, 1130
P.M. shift	1130 - 1800	1330, 1530, 1730

October 30, 31 and November 1 (12-hour fishing day)

River duty times		Count times (one count per day, time randomly selected)
A.M. shift	630 - 1300	700, 900, 1100
P.M. shift	1000 - 1630	1200, 1400, 1600

APPENDIX 2. Angler interview form 3600-114.

DEPARTMENT OF NATURAL RESOURCES

ANGLER INTERVIEW

FORM 3600-114 REV. 5-82

COUNTY	COUNTY CODE*	WATER NAME	WATER NUMBER*	1. ☐ LAKE* 2. ☐ STREAM*	SHEET NUMBER*
	— —		— — — —		— — — —

CENSUS SITE	DATE (MONTH-DAY-YEAR)*	1. ☐ WEEKDAY* 2. ☐ WEEKEND/HOLIDAY*
— — —	— — / — — / — —	

1. WAS THE ANGLER A: 1. ☐ DRIVER 2. ☐ PASSENGER 3. ☐ NO VEHICLE

2. AGE: 1. ☐ UNDER 16 2. ☐ 16-64 3. ☐ 65 & OVER

3. SEX: 1. ☐ MALE 2. ☐ FEMALE

4. ANGLER RESIDENCE: 1. ☐ WIS. 2. ☐ NON-RES.

DISTANCE (MILES): 1. ☐ 0-25 2. ☐ 26-50 3. ☐ OVER 50

WIS. COUNTY CODE OR NON-RESIDENT STATE: — —

5. LICENSE: 1. ☐ NONE 2. ☐ SPORT 3. ☐ RES. COMB. 4. ☐ PERM. RES. 5. ☐ ANNUAL 6. ☐ FAMILY 7. ☐ 15-DAY 8. ☐ 4-DAY

6.* NUMBER OF ANGLERS IN PARTY: — —

7. TYPE OF TACKLE (MAX. OF 2): 1. ☐ SPINNING 2. ☐ BAIT CASTING 3. ☐ FLY 4. ☐ CANE POLE 5. ☐ JIG POLE 6. ☐ TIP UP 7. ☐ OTHER _____

8. ANGLING METHOD (MAX. OF 2): 1. ☐ STILL FISHING 2. ☐ CASTING 3. ☐ TROLLING 4. ☐ JIGGING 5. ☐ SNAGGING 6. ☐ OTHER _____

9. BAITS USED (MAX. OF 2): 1. ☐ WORM 2. ☐ MINNOW 3. ☐ OTHER NAT. BAIT 4. ☐ PREPARED BAIT 5. ☐ SPINNERS 6. ☐ SPOONS 7. ☐ PLUGS 8. ☐ FLY 9. ☐ JIGS 10. ☐ OTHER _____

10. ANGLER WAS: 1. ☐ GUIDED 2. ☐ NOT GUIDED

11.* FISHING WAS FROM: 1. ☐ BOAT 2. ☐ SHORE OR DOCK 3. ☐ WADING 4. ☐ ICE SHANTY 5. ☐ OPEN ICE

12.* COMPLETED FISHING: 1. ☐ YES 2. ☐ NO

13.* TIME STARTED FISHING: — — : — —

TIME INTERVIEWED OR 14.* TIME ENDED FISHING: — — : — —

15.* CATCH AND HARVEST INFORMATION:

SPECIFICALLY FISHED FOR	% OF TIME FISHED FOR	NUMBER CAUGHT	NUMBER KEPT

*MANDATORY INFORMATION

16. LENGTH IS RECORDED IN: 1. ☐ INCHES & TENTHS 2. ☐ CM & MM

17. WEIGHT IS RECORDED IN: 1. ☐ POUNDS & OUNCES 2. ☐ KGS. & GRAMS

SPECIES CODE		18. SPECIES	LENGTH		WEIGHT		FIN CLIP	TAG		TAG NUMBER
			IN. CM.	10TH MM.	LBS. KGS.	OZ. GMS.		TYPE	COLOR	
L. STURGEON	B01									
SHOVELNOSE	B02									
GAR, UNSP.	D00									
BOWFIN	E01									
HIODON, UNSP.	H00									
CISCO	I04									
L. WHITEFISH	I05									
COHO S.	I14									
CHINOOK S.	I16									
ATLANTIC S.	I20									
TROUT, UNSP.	I01									
RAINBOW T.	I19									
BROWN T.	I21									
BROOK T.	I22									
LAKE T.	I23									
TIGER T.	I27									
SPLAKE	I28									
SMELT	J01									
N. PIKE	L02									
MUSKIE	L03									
HYB. MUSKIE	L08									
CARP	M12									
BUFFALO, UNSP.	N03									
REDHORSE, UNSP.	N04									
SUCKER, UNSP.	N02									
WH. SUCKER	N09									
BULLHD., UNSP.	O00									
BLACK BHD.	O05									
BROWN BHD.	O07									
YELLOW BHD.	O06									
CH. CATFISH	O08									
FLATHD. CAT.	O12									
BURBOT	R01									
WHITE BASS	V01									
YELLOW BASS	V02									
PANFISH	Z97									
SUNFISH, UNSP.	W03									
ROCK BASS	W04									
GREEN SUNFISH	W05									
PUMPKINSEED	W06									
WARMOUTH	W07									
BLUEGILL	W09									
WH. CRAPPIE	W13									
BL. CRAPPIE	W14									
Y. PERCH	X15									
SM. BASS	W11									
LM. BASS	W12									
SAUGER	X21									
WALLEYE	X22									
FW. DRUM	Y01									

19. COMMENTS:

— — — (COMMENT CODE)

GENERAL INSTRUCTIONS

A SEPARATE SHEET IS REQUIRED FOR EACH ANGLER

The following information must be correctly entered or the sheets will be returned for recoding:

COUNTY CODE	SHEET NUMBER (sequential for water censused)
WATER NUMBER	DATE, and WEEKDAY or WEEKEND/HOLIDAY (Check one)
LAKE or STREAM (Check one)	Items 1*, 6*, 11*, 12*, 13*, 14*, 15*

The spaces for WATER NAME and COUNTY are included for your convenience and are not necessary for processing. CENSUS SITE may be used to designate the stream section, pool, access site, etc., and up to three numbers must be entered to specify the interview site for computer processing. Corresponding census site designations must also be entered on the instantaneous counts forms.

Item *1-3. Self explanatory, check one box only for each item.

4. Check RESIDENCE, MILES, and enter the appropriate Wis. county code. Non-resident's state should be entered as IL (Illinois), MI (Michigan), MN (Minnesota), IA (Iowa), IN (Indiana), OH (Ohio), MO (Missouri), etc.

*6. Enter the TOTAL NUMBER IN THE ANGLER'S PARTY (a lone angler is entered as 01).

7-10. Check no more than two boxes each for items 7, 8, and 9. Check item 10.

*11. Check only one box for FISHING WAS FROM.

*12. Check one.

*13-*14. Enter as military time. If the trip is still underway, enter the time of the interview; if the trip was completed, enter the time it ended.

*15. Enter the code for each species the angler SPECIFICALLY FISHED FOR. Species groups like PANFISH (Z97) or TROUT, UNSPECIFIED (I01) may be used if necessary. Use only the species codes listed on this form.

The percent of angler's trip that is spent fishing for each species must be recorded as a whole number. For example, if an angler fishes one hour for muskie and four hours for panfish, allocate 20% of the time to muskie and 80% to panfish. An angler who uses two rods and fishes for different species simultaneously (i.e., minnow fishing for walleye while casting for muskie) could have 100% of the time allocated to each species. If an angler reports fishing simultaneously for two species with one rod (i.e., casting for bass and northern pike), each could be allocated 100% of the angler's time. Any incidental catch (e.g., picking up a northern pike while bait fishing for panfish) should be allocated 0% of the angler's time.

NUMBER CAUGHT and NUMBER KEPT must be entered. "0" must be entered if no catch was reported.

16-17. Check the appropriate box if length or weight measurements are made.

18. Enter the SPECIES CODE and LENGTH. If inches are used, enter inches and tenths. *Fractions are not acceptable.* If millimeters are used, a 900 mm fish would be entered as:

cm	mm
90	0

Weight *must be* entered as kilograms and grams or as pounds and ounces.

If grams are used, a 1,045 gm fish would be entered as:

kgs	gms
1	045

Enter fin clip code, tag type and color, and tag number as specified in the information package accompanying these forms.

19. Any additional information may be entered under COMMENTS. This information may be coded with up to three letters and/or numbers for computer processing.

APPENDIX 3. Creel survey postcards.

PLEASE SUBMIT THIS FORM WHETHER OR NOT YOU CAUGHT A STURGEON!

MENOMINEE RIVER STURGEON SURVEY

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Please complete this form when you are through fishing today by recording the information requested below. List the information for one fishing trip only. Your cooperation will help improve sturgeon fishing in the Menominee River. Please use the pre-addressed, postpaid envelope and mail your response soon. Thank you very much.

1. Date of fishing trip: _____

2. Number of hours fished: _____

3. Number of legal sturgeon caught: _____

4. If you caught one or more legal sturgeon, please indicate:

Length	Weight	Tag Number, if any

5. Number of sub-legal sturgeon caught:

   A. 42-50 inches long: _____

   B. Less than 42 inches long: _____

6. Other fish species caught: _____

7. Fishing from: (circle) Boat Shore

8. Section of river fished: (check)
   A. Above Bear Point
   B. Below Bear Point
   C. Grand Rapids Dam to County X Park

Your Name _____

Number and Street: _____

City, State, Zip: _____

Sex: M F Creel Card Number _____

THANKS AGAIN!

Greg Kornely
Fish Management Technician - Marinette

APPENDIX 4. Summary of lake sturgeon fishery and harvest statistics on the Menominee River, 1969, 1970, 1981, 1982, and 1983.

Statistics	Values Obtained From Postcard Returns					Values Obtained From Interviews		
	Section 1 & 2				Section 3	Section 1 & 2		Section 3
	1969	1970	1981	1982	1983	1981	1982	1983
Number of personal contacts	552	411	407	526	560	407	526	560
Number of postcards returned	379	230	202	214	174	--	--	--
Percent returns	69	56	50	41	31	--	--	--
Total hours of fishing surveyed	2,655	2,103	1,367	1,452	1,331	944	1,169	1,607
Average hours per completed trip	7.0	6.5	6.4	6.4	6.5	4.5	6.5	3.6
Estimated number of fishing trips	2,050	1,750	987	978	739	1,404	963	1,334
Percent contacted	25	23	41	54	78	--	--	--
Estimated number of anglers	1,200	1,100	580	543	425	--	--	--
Sturgeon reported 50"+	--	--	4	10	4	3	8	8
Estimated number caught 50"+	--	--	18	43	14	29	43	24
Sturgeon reported 42"+	11	9	35	34	22	--	--	--
Estimated number caught 42"+	59	48	161	146	79	--	--	--
Sturgeon reported < 42"	200	271	313	462	592	--	--	--
Estimated number caught < 42"	1,072	1,420	1,447	1,991	2,136	--	--	--
Sublegal lake sturgeon per hour	0.72	0.129	0.252	0.335	0.458	0.088	0.080	0 251
Sturgeon reported < 50"	--	--	344	486	610	83	94	404
Estimated number caught < 50"	--	--	1,590	2,094	2,201	556	503	1,027
Legal lake sturgeon per hour	0.004	0.004	0.0029	0.0069	0.0030	0.0032	0.0068	0.0050
Exploitation rate (%)	13	17	--	--	--	--	--	--

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